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A METHOD FOR TESTING RESIDUAL DEPOSITS

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With the discovery of the new insecticides that leave long-lasting deposits, it became necessary to find methods for testing the effectiveness of the residues. The laboratory method presented herein for testing the effectiveness of the residue of DDT can be used for other similar materials.

Apparatus

Twenty-six-gage galvanized iron was used to construct the frame shown in figure 1, A. The two sides of this frame fitted the fronts of two 9-inch cubical, screened fly cages with sliding glass doors (figs. 2 and 3). A slot 1/4 inch high and 1½ inches wide was cut in the middle of the lower edge of each of the metal strips which fitted across the bottom of the glass doors. These slots were connected by two 6-inch, L-shaped metal strips, one on each side of the slots (fig. 1). These connecting strips were 1½ inches high, with an additional 1/4 inch turned inward on the bottom.

Two 6-inch lengths of 1/4-inch bar steel (fig. 1, C) and two pieces of double-strength window glass 1½ by 6 inches (fig. 1, B) were cut. One piece of glass was placed between the L-shaped metal strips connecting the slot openings, and a steel bar was placed on each side of the glass. The other piece of glass was laid on top of the bars. When the glass fronts of the cages were lifted above the slot openings, a tunnel connecting the two cages was formed (fig. 3). Flies from one cage could then walk over to the other, the dimensions of the tunnel prohibiting flying across.

Testing Procedure

One side of each glass piece was treated with an acetone-refined kerosene solution containing 5 grams of DDT per 100 ml. Only enough acetone to dissolve the DDT was used. This solution was applied from a pipette. One inch at each end of each piece of glass was not treated. The remaining 6 square inches received 0.05 ml. of solution, or 2.5 mg. of DDT. This deposit is equivalent to 60 mg. of DDT per square foot. The application was allowed to dry overnight before use.

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[1] Now with the Office of Experiment Stations.

One empty cage and one well stocked with 2- to 3-day-old flies were joined by the apparatus. The tunnel was assembled as previously described, the treated surface of the bottom glass facing up and that of the top piece facing down. The glass fronts of the cages were then lifted long enough to allow approximately 100 flies to cross over. A fly required about 2 seconds to walk across.

Numerous tests were made with the apparatus. In one series of six tests, when the DDT dosage specified above was used, an average of 100.7 ± 8.6 flies per test crossed the treated glass. The average number of males per test was 48.8 ± 4.8 and of females 51.8 ± 8.0. This is quite close to a 50-50 sex ratio. The mean mortality for these six tests was 46.1 ± 6.3 percent. The mean mortality for males was 43.0 ± 7.5 percent and for females 45.7 ± 7.3 percent.

Relative toxicities of residues of various formulations can be determined by this method. Studies of the effect of storage on various insecticides can also be made by comparison with freshly made standards.

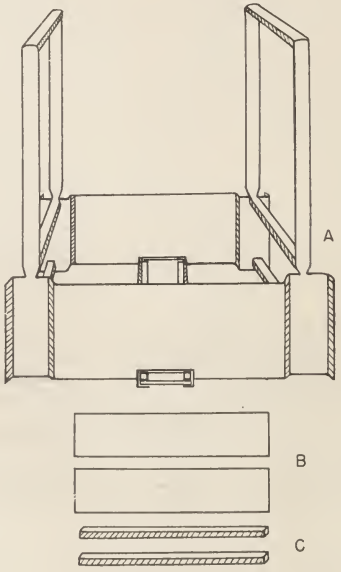

Figure 1.--A, Metal frame for connecting two cubical fly cages. B, Glass slides used in making the tunnel. C, Metal bars used to hold the glass slides apart and form the tunnel.

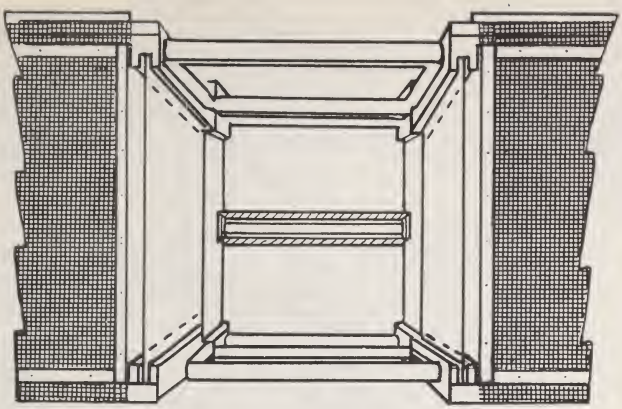

Figure 2.--Metal frame with the two cages attached. Looking down on the tunnel.

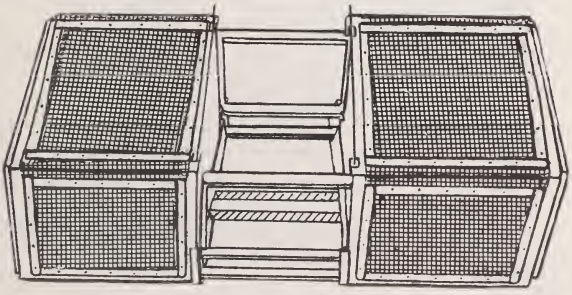

Figure 3.--Metal frame with the two cages attached, showing complete assembly.

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